preparations. Cosmetic and pharmaceutical preparations utilize liquid silicones hence an oil-like material is required (see attached silicones from Hackh's Chemical Dictionary). Applicants therefore respectfully submit that the hydroxycarboxylic acid esters must be oils to be useful in the Kahre et al. composition. As is shown in the prior art of record in the present application, partial esters of hydroxycarboxylic acids are known to be solid materials at room temperature. Applicants therefore respectfully submit that partial esters of hydroxycarboxylic acids are not useful in the Kahre et al. composition. The Examiner states that the fatty compounds substitute can comprise an oil component that is a hydroxycarboxylic acid ester of citric, malic or tartaric acid with an alcohol, such as a long-chain fatty alcohol. The Examiner then states:

> "...however it is known to those of ordinary skill in the art that an "oil" is by definition a mixture or different compounds, such as different esterified forms, and thus includes partial esterified forms."

Applicants respectfully submit that the Examiner clearly does not understand the nature of an "oil". An oil is distinguished by its physical properties such as viscosity, general water insolubility and properties such as slipperiness, lubricity and the like. However, it is well known in the art that an "oil" may not be a mixture of various compounds. Applicants invite the Examiner's attention to well known oils such as a low molecular weight alkyl ester of a fatty acid such as methyl laurate, which can be a relatively pure compound.

The Examiner states that the oil can contain mixtures of various esterified forms of the hydroxycarboxylic acids. Applicants respectfully submit that a major portion of the

hydroxycarboxylic acids disclosed in Kahre et al. are monocarboxylic acids and therefore only full esters be prepared utilizing fatty alcohols.

The prior art clearly teaches that the partial esters are solids rather than oils (liquids) and would not be useful to replace the liquid silicone useful in cosmetic preparations. As is known in the art, the partial esters of hydroxypolycarboyxlic acids are solid material and can readily be separated by their solubility in various solvents including water. Although the preparation of the partial esters could involve formation of the full esters, it is readily apparent that the full esters could be easily separated from the partial esters to provide a mixture in which the full esters were a minor impurity (see prior art of record).

At page 4 of the Advisory Action, the Examiner states:

> "Applicants also argue that Weil et al. teaches that di and tri-esters of citric acid severely limit foaming, and thus that it would not be obvious to combine the esters of Weil et al. in the composition of Kahre et al. The Examiner notes that Weil et al. does not teach that the monoester would be problematic with foaming, and thus it is considered that it would be obvious to combine the monoester of Weil et al. into the composition of Kahre et al."

In this statement, the Examiner appears to be providing an argument counter to the argument presented at page 3, second paragraph. If the partial esters always contain mono di and tri-esters, then the di and tri-esters would severely limit foaming as disclosed in Weil et al.

The Examiner states:

> "Applicants also argue that Kahre et al. and the other references do not teach the improved foam stability or mucous membrane compatibility achieved by the instantly claimed composition. The fact that applicant has recognized another advantage which would flow naturally from following the suggestion of the prior art cannot be the basis for patentability when the

differences would otherwise be obvious. See *Ex parte Obiaya*, 227 USPQ 58, 60 (Bd. Pat. App. & Inter. 1985)."

Applicants respectfully submit that from the general teachings of the prior art, the effects of mucus membrane compatibility and improved foam stability are unexpected properties from a small group of hydroxypolycarboxylic acid esters.

Applicants respectfully request that the Examiner reconsider and allow the application.

Respectfully submitted,

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Enclosure: Hackh's Chemical Dictionary, pgs. 770 & 771

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The many silica minerals may be grouped into: (1) Phenocrystalline or vitreous minerals (see *quartz*). (2) Cryptocrystalline and amorphous minerals (see *chalcedony*). (3) Amorphous and colloidal minerals (see *opal*). amorphous- A colorless powder, d.2.30, m.1650; insoluble in water or alcohol, soluble in hot alkalis or hydrofluoric acid; used for chemical glassware. colloidal- See *silicic acid*. crystalline- Colorless hexagonal, transparent prisms, $d_{15°}$2.660 m.-1760, insoluble in water, alcohol, alkalis or acids, soluble in hydrofluoric acid. Used in optical instruments, and for chemical glassware as a platinum substitute. The main crystalline forms (quarts, tridymite and cristobalite) have definite transition points, (870°C. and 1470°C., respectively).

s. brick. A fire-brick containing over 92 % s.; its crystalline phase is cristobalite and tridymite. s. gel. A gelatinous form of silica which, if activated, absorbs water; used to dry blast-furnace gases, air, and other gases. s. minerals. A group of rock-forming minerals:

quarts, tridymite.... SiO_2

Feldspar group

orthoclase..... $KAlSi_3O_8$
albite..... $NaAlSi_3O_8$—Ab
anorthite..... $CaAl_2Si_2O_8$—An

The composition of other rocks is indicated by the proportion of Ab and An; as,

oligoclase..... Ab_3An_1 to Ab_2An_1
andesine..... Ab_2An_1 to Ab_1An_1
labradorite..... Ab_1An_1 to Ab_1An_2
bytownite..... Ab_1An_2 to Ab_1An_3

Leucite group

leucite..... $KAlSi_2O_6$
analcite..... $NaAlSi_2O_6$

Nephelite group

nephelite..... $NaAlSiO_4$
kaliophylite..... $KAlSiO_4$
eucryptite..... $LiAlSiO_4$

Cancrinite-sodalite group

cancrinite..... $Al_3Na_4HCSi_3O_{13}$
sodalite..... $Al_3Na_4ClSi_3O_{12}$
hauynite..... $Al_3Na_3CaSi_3O_{12}$
noselite..... $Al_3Na_4SSi_3O_{12}$

Pyroxene group

enstatite..... $MgSiO_3$
hypersthene..... $FeSiO_3$
wollastonite..... $CaSiO_3$
diopside..... $CaMgSi_2O_6$
hedenbergite..... $CaFeSi_2O_6$
acmite..... $NaFeSi_2O_6$
jadeite..... $NaAlSi_2O_6$
spodumene..... $(Li, Na)_2 AlSi_2O_6$

Amphibole group

anthophyllite..... $(Mg, Fe)SiO_3$
tremolite..... $CaMg_3Si_4O_{12}$
glaucophane..... $NaAlSi_2O_6.FeSiO_3$

Olivine group

forsterite..... Mg_2SiO_4
fayalite..... Fe_2SiO_4
monticellite..... $MgCaSiO_4$
glaucochroite..... $CaMnSiO_4$

Mica group

muscovite..... $Al_3KH_2Si_3O_{12}$
paragonite..... $Al_3NaH_2Si_3O_{12}$
lepidolite..... $AlR_3F_2Si_3O_9(Li,K)$
biotite..... $Al_3Mg_3KH_2Si_3O_{12}$
phlogopite..... $AlMg_3KH_2Si_3O_{12}$
chloritoid..... $Al_2FeH_2SiO_7$

Chlorite group

A number of minerals of the type, $Al_2(MgOH)_4(SiO_4)_3$ and $Al(MgOH)_4H_3(SiO_4)_3$.

Melilite group

melilite..... $(Al,Fe)_2(Ca,Mg)_3Si_2O_{12}$
gehlenite..... $Al_2Ca_2Si_2O_{12}$
akermanite..... $Ca_2Si_2O_{12}$
sarcolite..... $Al_2(Na_2Ca)_3Si_3O_{12}$

Garnet group

grossularite..... $Ca_3Al_2Si_3O_{12}$
pyrope..... $Mg_3Al_2Si_3O_{12}$
almandite..... $Fe_3Al_2Si_3O_{12}$
spessartite..... $Mn_3Al_2Si_3O_{12}$
garnet..... $Ca_3Fe_2Si_3O_{12}$
uvarovite..... $Ca_3Cr_2Si_3O_{12}$
lagorinlite..... $Na_3Al_2Si_3O_{12}$

Scapolite group

meionite..... $Ca_4Al_6Si_6O_{25}$
marialite..... $Na_4Al_3Si_9O_{24}Cl$

Iolite group

iolite..... $H_2(Fe,Mg)_2Al_3Si_5O_{18}$

Zoisite group

zoisite..... $HCa_2Al_3Si_3O_{13}$
epidote..... $HCa_2(Al,Fe)_3Si_3O_{13}$
piedmontite..... $HCa_2(Al,Mn)_3Si_3O_{13}$

Topaz group

topaz..... $Al_2SiO_4F_2$

Andalusite group

andalusite..... Al_2SiO_5
sillimanite..... Al_2SiO_5
kyanite..... Al_2SiO_5

Tourmaline group

A group of borosilicates of aluminum and other bases of the average type, $Al_7M_2Si_4B_3O_{21}$. M is lithium or sodium, and sometimes potassium, in the alkali-tourmalines; magnesium, in the magnesium tourmalines; iron, in iron tourmalines.

Zeolite group

heulandite..... $CaAl_2Si_6O_{16}.5H_2O$
stilbite..... $(Na_2,Ca)Al_2Si_6O_{16}.6H_2O$
laumontite..... $CaAl_2Si_4O_{12}.4H_2O$
chabazite..... $CaAl_2Si_4O_{12}6H_2O$

Miscellaneous group

beryl..... $Al_2Be_3Si_6O_{18}$
serpentine..... $H_4Mg_3Si_2O_9$
talc..... $H_2Mg_3Si_4O_{12}$

silicam. $Si_2N_2H_2$ = 100.2. A white powder obtained by heating silicon imide, $Si(NH)_2$. Insoluble in water, and forms silicon nitride, Si_3N_4, when further heated.

silicane. (1) A silane; that is, a compound of the type Si_xH_y. (2) An organic compound of the type SiR_4, where R is a hydrocarbon radical. (3) SiH_4 = 32.08. Monosilane, silicomethane, silicohydride. A colorless gas, m. −185, b. −112. bromo- SiH_3Br = 111.0. A colorless gas, $d_{-80°}$1.72, m.94, b.1.8. chloro- SiH_3Cl = 66.54. A colorless gas, $d_{-112°}$1.145, m. −118, b. −30.4. di- SiH_2 = 62.16. Silicoethane, a gas, m. −132. dibromo- SiH_2Br_2 = 189.91. A colorless liquid, d.2.17, m. −70.1, b.66. dichloro- SiH_2Cl_2 = 100.99. A colorless gas, $d_{-112°}$1.42, m. −122, b.8.3. dimethyl- SiH_2Me_2 = 60.12. Dimethylmonosilane. Colorless gas, $d_{-20°}$0.68, m. −150, b. −20. ether- $(SiH_3)_2O$ = 78.17. Disilaneoxide. A colorless gas, $d_{-20°}$0.681, m. −143.5, b.15.2. ethoxy-triethyl- Et_3SiOEt = 160.22. Triethylsilane ethyloxide triethylsilicol ethylether. Colorless liquid, d.0.8403, b.153, insoluble in water. hydroxy- Silicol. methyl- $MeSiH_3$ = 46.11. Methylmonosilane. Colorless gas, $d_{-21°}$0.62.

m. −156.5, b. −56.8. tetra- Si_4H_{10} = 122.31. Silicobutane. A gas, m. −93.5. tetrabromo- Silicon bromide. tetrachloro- Silicon chloride. tetraethyl- $Si(C_2H_5)_4$ = 144.25. Silicon tetraethyl, siliconanane, $SiEt_4$. A colorless liquid, d.0.7682, b.152. tetrafluoro- Silicon fluoride. tetraiodo- Silicon iodide. tetramethyl- $SiCH_4$ = 144.22. Silicon tetramethyl, $SiMe_4$. Colorless liquid, d.0.645, b.27. tetraphenyl- $Si(C_6H_5)_4$ = 336.24. Silicon tetraphenyl, tetraphenylsilicon, $SiPh_4$. Colorless crystals, m.-233. tri- Si_3H_8 = 93.24. Silicopropane. A gas, m. −117. tribromo- $SiHBr_3$ = 268.82. Silicobromoform. A colorless liquid, d.2.7, m. −80, b.109. trichloro- Silicochloroform. trichloroethyl- $Si(C_2H_5)Cl_3$ = 163.47. A colorless liquid, d.1.230. trichlorophenyl- $Si(C_6H_5)Cl_3$ = 211.47. A colorless liquid, d.1.326, b.197, decomp. in water. triethyl- $(C_2H_5)_3SiH$ = 116.18. Triethylsilicon, silicoheptane, $SiEt_3H$. Colorless liquid, d.0.751, b.107, insoluble in water. trifluoro- $SiHF_3$ = 85.07 Silicofluoroform. A colorless gas, m. −110, b. −80.2. triiodo- SiI_3H = 409.83. Silicoiodoform. A red liquid, d.3.314, m.8, b.220.

silicate. A salt derived from silica or the silicic acids. They form, by far, the largest group of minerals (see *silica*), and are derived from the two types: M_4SiO_4—*ortho*silicate; M_2SiO_3—*meta*silicate, which may combine to form a number of *poly*silicates. With the exception of the alkali silicates, they are insoluble in water (see *silica minerals*). s. cement. See *dental* cement. s. of soda. Sodium silicate.

siliceous. Containing quartz or silica. s. algae. See *algae*. s. deposit. S. sinter. The solid accumulation of silica deposited from hot mineral springs or geysers. Cf. *geyserite, fluorite*. s. sinter, S. deposit.

silicic. (1) Containing silica or silicon. (2) Containing silicic acid. s. acid. H_4SiO_4 = 96.3. Ortho-silicic acid. Colorless, amorphous powder, d.1.576; slightly soluble in water. di- $H_2Si_2O_5$ or $H_4Si_2O_7$. A white insoluble powder. meta- H_2SiO_3 = 78.1. A white powder, d.1.813; insoluble in water, soluble in alkalis. tri- $H_4Si_3O_8$ = 216.3. A white insoluble powder.

SILICIC ACIDS

%H_2O	%SiO_2	
↓	↑	$H_2Si_4O_9$ = $4SiO_2.H_2O$, tetra-
		$H_2Si_2O_5$ = $2SiO_2.H_2O$, meta-di-
		$H_4Si_3O_8$ = $3SiO_2.2H_2O$, meta-tri-
		H_2SiO_3 = $SiO_2.H_2O$, meta-
		$H_4Si_3O_{10}$ = $3SiO_2.4H_2O$, ortho-tri-
		$H_6Si_2O_7$ = $2SiO_2.3H_2O$, ortho-di-
		H_4SiO_4 = $SiO_2.2H_2O$, ortho-

silicide. A binary compound of tetravalent silicon and a metal; as, M_2Si, where M is Fe, Ni, Co, Cr, Mn, Cu, or Mg.

silicification. The gradual replacement of rocks or fossils by silica (petrifaction).

silicified. Describing an organic material (*e.g.*, wood) that has been converted into silica (petrified).

silicium. Silicon.

silico- A prefix indicating silicon, generally in organic compounds. s. acetic acid. $MeSiOOH$ = 76.1. An insoluble solid. s. benzoic acid. $PhSiOOH$ = 138.1. A solid, m.-92; insoluble in water, soluble in alcohol or ether. s. bromoform. $SiHBr_3$ = 268.9. A heavy, colorless liquid, d.2.7, b.116; decomp. by water. s. butane. See *silanes*. s. calcium. A product of the electric furnace used to deoxidize steel. s. chloroform. $SiHCl_3$ = 135.36. A colorless liquid, d.1.34, m. −1.3, b.34; decomp. by water. s. decitungstic acid. $H_8SiW_{12}O_{40}$ or $SiO_2.12WO_3.4H_2O$. A white powder used as a reagent, as it forms insoluble cesium salts. s. ethane. Disilane (see *silanes*). s. fluorides. Fluosilicates. s. fluoric acid. Fluosilicic acid. s. formic acid. See *leucane*. s. heptane. Et_3SiH = 116.1. Triethylsilane. A colorless liquid, d.0.751, b.107. s. hydrides. Silanes. s. iodoform. $SiHI_3$ = 409.9. A colorless heavy liquid, d.3.4, b.220; decomp. by water. s. methane. Silane. s. oxalic acid. $Si_2O_4H_2$ = 122.2. HOOSi.SiOOH. A white, unstable solid. s. tungstic acid. S. decitungstic acid.

silicol. Hydroxysilan. A compound of the type R_3SiOH; as, triethyl- Et_3SiOH = 132.18. Silicoheptyl alcohol. A colorless liquid. d.-0.8709, b.154, insoluble in water.

silicon. Si = 28.06. Silicium. A non-metallic element of the carbon group, atomic number 14. It occurs in several allotropic modifications: (1) *amorphous* s. A brown powder, d.2.35. (2) *crystalline* s. A grayish-black crystalline powder, d.2.49, m.1600; insoluble in water, soluble in alkalis. (3) *graphitoidal* s. A dense crystalline form, or graphite-like masses deposited from molten silicon. (4) *adamantine* s. Needle-shaped crystals of silicon of extreme hardness. The principal valency of s. is four, and like carbon, it forms many complex compounds that are an essential part of the earth surface (rocks). See *silica minerals*. ethyl- The radical $\equiv SiEt$, of. *silicane*. methyl- The radical $\equiv SiMe$. radio- The isotope of mass 27. Cf. *radioelements*.

s. alkyls. (1) A group of hydrogen compounds of silicon corresponding with the hydrocarbons; as, SiH_4, Si_2H_6 etc. See *silane*. (2) An organic compound of Si and alkyl radicals; as, $SiMe_4$, $SiEt_4$ etc. See *silicanes*. s. alloys. A group of non-corrosive alloys of silicon with metals; as, duriron, ironac, narkl, silumin, and tantiron. Cf. s. *copper*, s. *steel*, s. *zirconium*. s. borides. The hard compounds SiB_3 and SiB_6. s. bronze. A noncorrosive alloy of silicon, copper, and tin. s. bromides: (1) $SiBr_4$ = 347.9. S. tetrabromide. A colorless fuming liquid, d.2.813, m. −12, b.154; decomp. by water to silicic acid and hydrobromic acid. (2) Si_2Br_6 = 535.7. S. tribromide. A colorless solid, b.240, decomp. by water. s. carbide. SiC = 40.1. Colorless rhombohedric plates, d.3.12; dissociates at 2250°C., but has no melting point. Cf. *carborundum, silundum, crystolon*. s. chlorides: (1) $SiCl_4$ = 170.0. S. tetrachloride. A colorless fuming liquid, d.1.524, m. −87, b.57.6; decomp. by water to silicic and hydrochloric acid. Used in electrotechnics, and mixed with ammonia vapors, in the production of smoke screens. (2) Si_2Cl_6 = 269.0. S. trichloride. A white solid, d°.1.58, m. −1, b.146, decomp. by water. (3) Si_3Cl_8 = 367.8. S. octachloride. A white powder. s. copper. An alloy of 20–30 % Si and 70–80 % Cu, used in metallurgy. s. dioxide. Silica. s. disulfide. SiS_2 = 92.2. White needles, which sublime when heated, decomp. by water. s. ethane. See *silanes*. s. ethyl Tetra.